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ABSTRACT

In April 1995, Lexington Community College (LCC), in Kentucky, conducted a survey to gather information about employment trends and educational needs in the environmental technician field. The researchers defined environmental technicians as those who implement federal or state environmental requirements, monitor or sample the environment, audit workplaces for potential hazards, inform and train workers regarding potential hazards, implement appropriate controls, or complete related technical writing and computer applications. Questionnaires were mailed to 332 area firms, requesting information about job requirements and willingness to send employees to LCC for training in environmental technology. Study findings, based on responses from 146 firms, included the following: (1) 33% (n=48) of the firms employed personnel in the environmental field, employing an average of four environmental employees; (2) of 44 firms employing environmental technicians, 22 required only high school completion, 11 required a bachelor's degree, and 9 an associate's degree; (3) 48% of these firms required 1 to 2 years of experience for entry-level technicians; (4) 53% estimated increasing needs for environmental technicians over the next 5 years; and (5) 41 of the 48 firms employing environmental personnel indicated that they would send employees to LCC for one-day training sessions, while 31 would send them for multiple-day training. Data tables are included. The survey instrument is appended. (AJL)

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Environmental Technician Survey

May, 1995

*Environmental Science Technology Advisory Committee
Lexington Community College Committee Members*

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Data compiled and analyzed by Lexington Community College, Sandra Green, Coordinator of Institutional Research

Introduction.

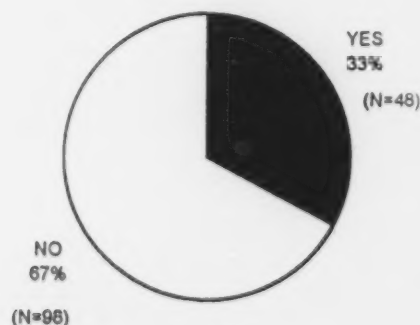
The Environmental Technician Survey was distributed and collected in April and May, 1995. Three hundred thirty-two surveys were mailed, with a return rate of 44% (N=146). The purpose of the survey was to assist the Lexington Community College (LCC) in gathering information about employment trends and educational needs in the Environmental Technician field.

An Environmental Technician was defined as one who performs one or more of the following job duties: implementing OSHA, EPA, DOT, or other requirements, monitoring/sampling the environment, auditing the workplace for potential hazards, informing and training workers regarding potential hazards, implementing appropriate control, and/or completing the related technical writing and computer applications.

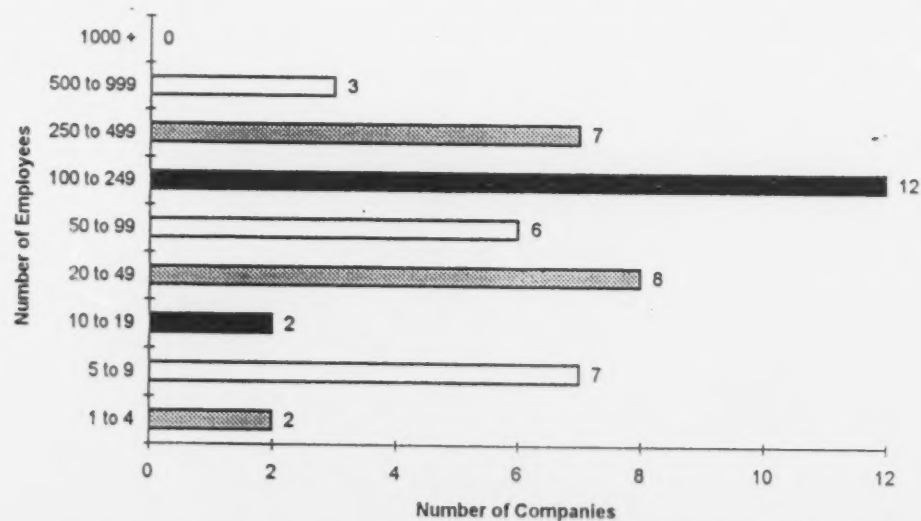
A complete copy of the survey can be found in Appendix A of this report.

Results.

Question 1. Does your firm/facility presently employ or utilize the services of personnel in the Environmental Technology field? 146 survey respondents answered this question.



Question 2. Please indicate the total number of employees at your firm/facility. 47 survey respondents answered this question.



Question 3. Please indicate the total number of employees doing environmental technician work. 44 survey respondents answered this question.

Total technicians = 189

Range = 0 to 18

Average = 4 employees

Mode = 1 employee

Question 4. Please enter the entry-level annual salary for environmental technicians. 31 survey respondents answered this question.

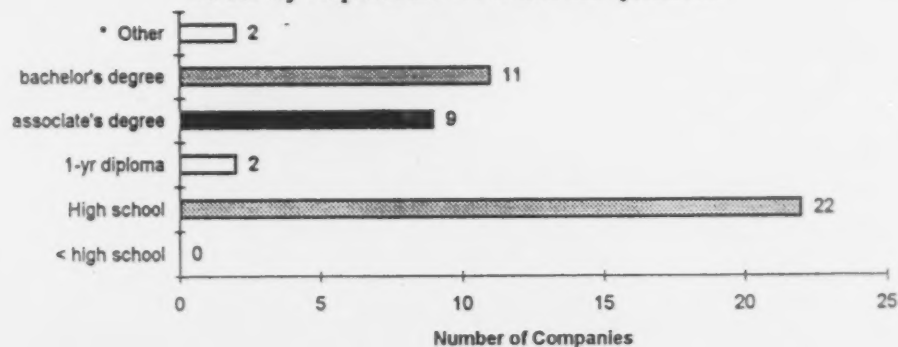
Range = \$10,000 to \$36,500

Average = \$21,274.06

Mode = \$15,000

Question 5. What is the minimum level of education *required* of an entry-level environmental technician?

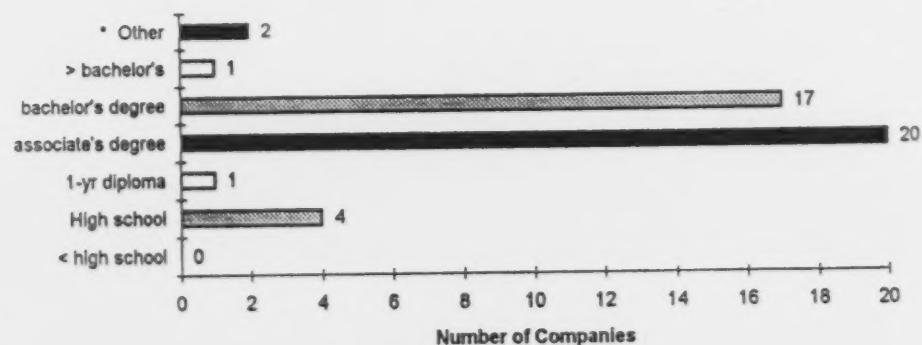
46 survey respondents answered this question.



- * other required education: "Training is provided as need occurs."
"Bachelor's or 2 years experience."

Question 6. What is the minimum level of education *preferred* of an entry-level environmental technician?

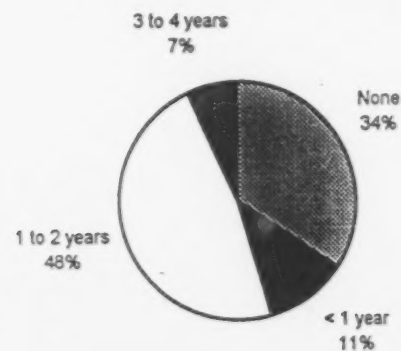
45 survey respondents answered this question.



- * other education preferred: "40 hour HAZWOPER OSHA training."

Question 7. What is the minimum level of work experience *required* for an entry-level technician?

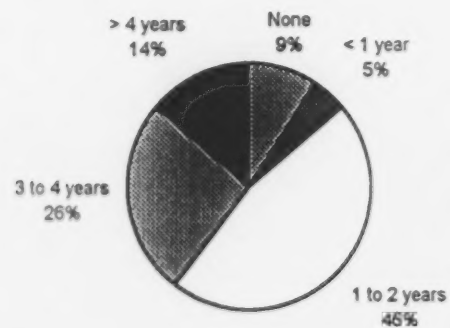
44 survey respondents answered this question.



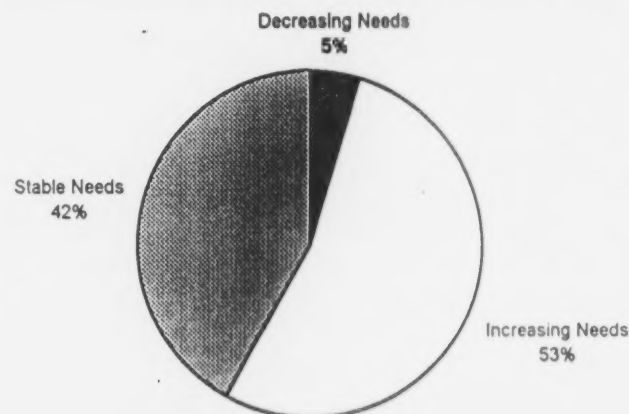
(More than four years = 0%)

Question 8. What is the minimum level of work experience *preferred* for an entry-level technician?

43 survey respondents answered this question.



Question 9a. Please estimate your needs for environmental technicians over the next 5 years. 43 survey respondents answered this question.



Question 9b. We estimate the following number of job openings in the next 5 years. 19 survey respondents answered this question.

Total Openings = 105
Range = 1 to 45
Average = 6
Mode = 1

Question 10. Please estimate the total number of employees within your firm/facility whom you think would be interested in enrolling in an Environmental Technician program. 40 survey respondents answered this question.

Total Interested = 86
Range = 0 to 10
Average = 2
Mode = 0

Question 11. Would completion of a two-year Environmental Technician program lead to job advancement in your firm/facility? 43 survey respondents answered this question.



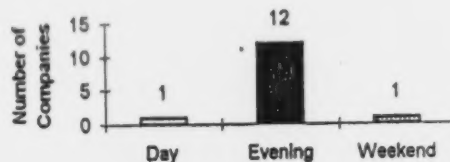
Question 12. Would your firm/facility send its employees to Lexington Community College for an associate degree in Environmental Technology? 45 survey respondents answered this question.

Yes - 31%
 No - 18%
 Uncertain - 51%

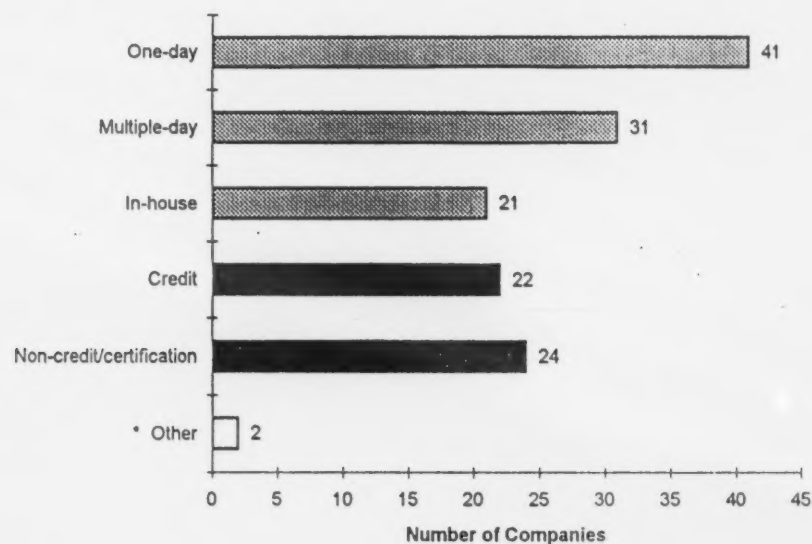
Question 13. If you answered yes to #12, please indicate the total number of employees your firm/facility would encourage to attend the community college for education in environmental technology. 13 survey respondents answered this question.

Total Encouraged = 35
 Range = 1 to 9
 Average = 3
 Mode = 2

Question 14. If you answered yes to #12, what time frame for class offerings do you prefer for your employees? 14 survey respondents answered this question.



Question 15. Would your firm/facility send its employees to Lexington Community College for environmental/certification training as required by OSHA, EPA, etc.? The numbers on the bar chart below represent the number of companies (out of the possible 48 that employ/utilize environmental technologists) reporting interest in each of the following types of training:



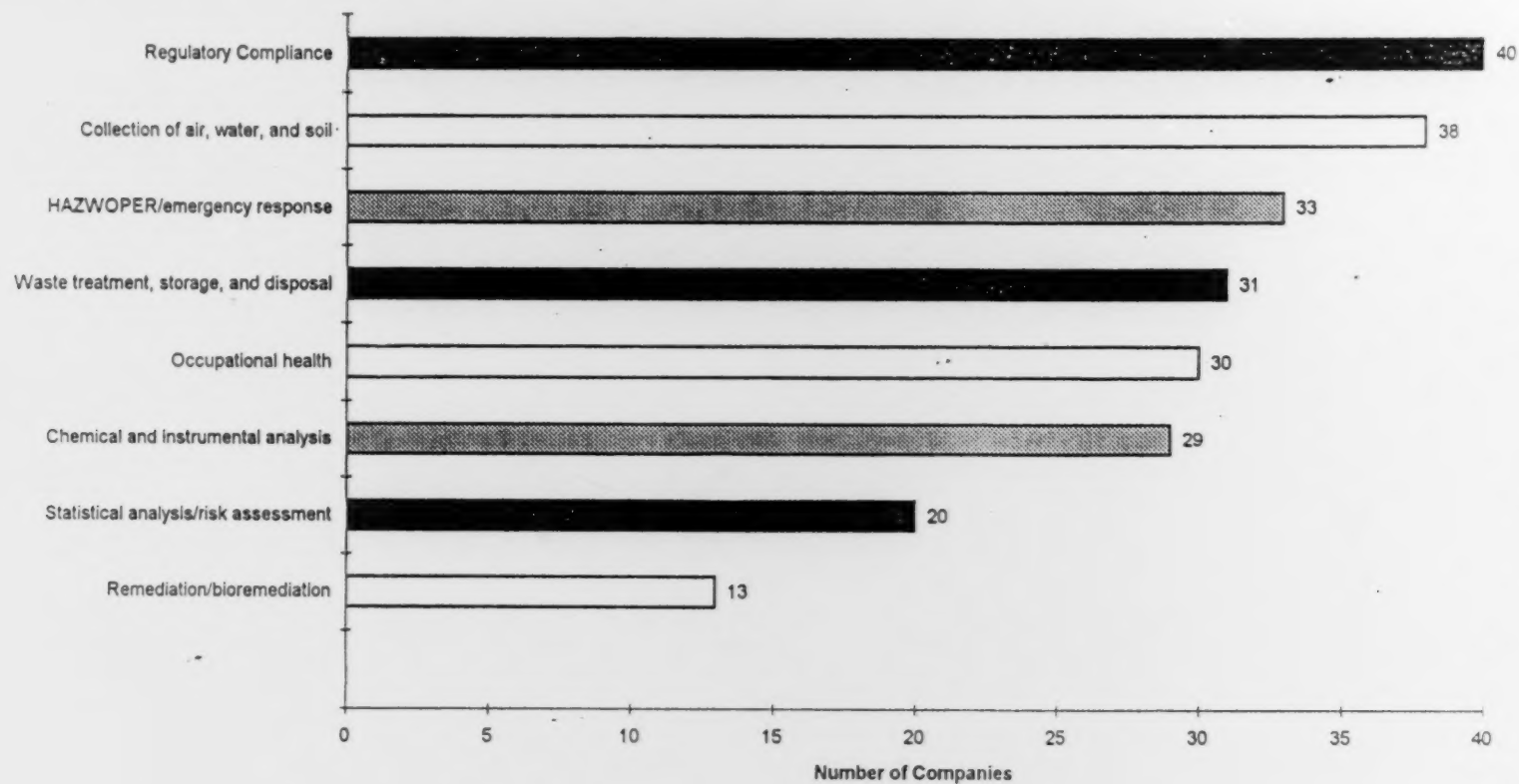
* other types of training listed: "Risk assessment and management of risk areas that may be remediated to less than perfect conditions."
 "OSHA 40 hour and refreshers."
 "Continuing education, certifications."

Question 16. Would your firm/facility be interested in having a LCC student enroll in an Environmental Technician Program, serve an internship or have a cooperative work experience at your site? 45 survey respondents answered this question.

Yes - 18%
 No - 16%
 Maybe - 67%

Question 17. The following is a list of skill/tasks that may be associated with environmental technology.

Please check all that apply to your firm. The numbers on the bar chart below represent the number of companies (out of the possible 48 that employ/utilize environmental technologists) reporting involvement with the listed skills/tasks:



Question 18. What do you see as the new and emerging trends in the field of environmental technology?

- * Insistence on pollution prevention/service reduction methodologies; recycling.
- * Develop environmental, health and safety management programs to organize a company to go beyond simple compliance and into areas of source reduction, pollution prevention and ergonomics.
- * Emphasis on risk assessment.
- * Various types of remediation.
- * The Clean Air Act will take up a lot of somebody's time. Recycling.
- * As in every other aspect of our lives, computers and computerized automation grows more prevalent everyday. This is evident in the water industry through plant automation, increased use of computerized SCADA (Supervisory Control and Data Acquisition) for operations and monitoring of report generation.
- * Statistical analysis and risk assessment for site closures.
- * Various types of on site remediation.
- * Protective equipment and air quality.
- * More training requirements; required auditing; job analysis.
- * Sampling of soil; Clean Air Act; risk management.
- * Clean water for streams for future generations. Sludge disposal to save landfill space.
- * Cost/benefit approach.
- * I don't think regulations will increase but hopefully will be reduced due to Federal Government cutbacks.
- * Environmental damage prevention; emphasis on air and water.
- * Proactive policies with management support and involvement.
- * Clean Air Act; Storm Water Act.
- * Ergonomics.
- * Increased regulation/regulatory compliance; increased training requirements; lack of qualified, available employees.
- * More education.
- * The need for well-trained, bright technicians.
- * Construction inspection of environmental projects in water, sewer, solid waste, dams, storm water.
- * Greater dependency on technology.
- * Risk assessment, air sparge technology, system telemetry, computer modeling, and litigation support.

- * IAQ, ergonomics.
- * Waste stream reduction, elimination or substitution; better, less costly recycling of waste; increased ergonomics and industrial studies and applications.

Question 19. What specific courses/seminars/workshops, etc. might we at the Lexington Community College offer to meet your future training needs? (Numbers in parentheses indicate total responses in the listed area.)

- * technical writing (2)
- * general surveying (2)
- * courses similar to those offered by other colleges specific to the environmental field
- * regulatory compliance (4)
- * waste water treatment (3)
- * OSHA courses (8) examples: industrial hygiene, occupational health, confined space entry, etc.
- * CDC
- * legal
- * HAZWOPER (4)
- * ergonomics
- * risk analysis/assessment techniques (3)
- * Clean Air Act
- * chemistry
- * BID-remediation, both augmented and artificially induced
- * Allow environmental technician students to come to worksites and assist in implementing environmental/OSHA programs.
- * recycling
- * environmental interface
- * computerizing and data management (2)
- * soil types/permeability/Karst geology (2)
- * overview of current technological trends
- * field sampling
- * environmental impact planning for capital projects
- * soil venting/air sparging

Additional Comments.

- * There is a shortage of technicians. Entry level is preferred because of extensive in-house training.
- * There is a growing need for personnel trained in this area.
- * Technical writing is a major weakness with many participants in this industry.
- * My environmental technician duties are currently being accomplished through a co-op student from UK with support from myself, our chemical engineer, and our consultants.
- * Environmental technicians will be required to fill an assortment of additional roles or responsibilities, especially in small organizations. They would include: computer skills associated with data entry, report generation, etc.; mechanical ability associated with equipment maintenance and (light) repair (pumps, motors, telemetry equipment, etc.); and, (potable) water treatment responsibilities.

CROSS-TABULATIONS.

Empty cells represent the absence of a response in the given category.
Percentages represent percentage of overall total unless otherwise specified.

Item 2 by Item 5. (Size of company by required education.)

Number of Employees	< High School		High School		1-Year Diploma		Associate's Degree		Bachelor's Degree		Other		Row Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1 - 4			1	2%			1	2%					2	4%
5 - 9			4	9%			1	2%	1	2%	1	2%	7	15%
10 - 19			1	2%			1	2%					2	4%
20 - 49			6	13%			2	4%					8	17%
50 - 99			4	9%					2	4%			6	13%
100 - 249			5	11%	2	4%	2	4%	2	4%			11	24%
250 - 499			1	2%			1	2%	5	11%			7	15%
500 - 999							1	2%	1	2%	1	2%	3	7%
1000+													0	0%
Column Total	0	0%	22	48%	2	4%	9	20%	11	24%	2	4%	46	100%

Item 2 by Item 7. (Size of company by required work experience.)

Number of Employees	None		< 1 Year		1 to 2 Years		3 to 4 Years		> 4 Years		Row Total	
	N	%	N	%	N	%	N	%			N	%
1 - 4					2	5%					2	5%
5 - 9	4	9%			2	5%					6	14%
10 - 19							2	5%			2	5%
20 - 49	3	7%	1	2%	4	9%					8	18%
50 - 99	5	11%			1	2%					6	14%
100 - 249	1	2%	2	5%	8	18%					11	25%
250 - 499	2	5%	2	5%	2	5%	1	2%			7	16%
500 - 999					2	5%					2	5%
1000+												
Column Total	15	34%	5	11%	21	48%	3	7%			44	100%

Item 2 by Item 9a. (Size of company by need for technicians over next 5 years.)

Number of Employees	Decreasing Needs		Stable Needs		Increasing Needs		Row Total	
	N	%	N	%	N	%	N	%
1 - 4					1	2%	1	2%
5 - 9	2	5%	2	5%	2	5%	6	14%
10 - 19			1	2%			1	2%
20 - 49			4	9%	4	9%	8	19%
50 - 99			1	2%	5	12%	6	14%
100 - 249			5	12%	6	14%	11	26%
250 - 499			4	9%	3	7%	7	16%
500 - 999			1	2%	2	5%	3	7%
1000+								
Column Total	2	5%	18	42%	23	53%	43	100%

Item 2 by Item 12. (Size of company by whether or not company would send its employees to LCC for an associate's degree in Environmental Technology.)

Number of Employees	Yes		No		Uncertain		Row Total	
	N	%	N	%	N	%	N	%
1 - 4			1	2%			1	2%
5 - 9	2	4%	2	4%	3	7%	7	16%
10 - 19	1	2%	1	2%			2	4%
20 - 49	1	2%			7	16%	8	18%
50 - 99	1	2%	1	2%	4	9%	6	13%
100 - 249	4	9%	1	2%	6	13%	11	24%
250 - 499	3	7%	2	4%	2	4%	7	16%
500 - 999	2	4%			1	2%	3	7%
1000+								
Column Total	14	31%	8	18%	23	51%	45	100%

Item 2 by Item 13. (Size of company by number of employees company would send for training.)

Number of Employees	1 or 2 employees		3 to 5 employees		> 5 < 10 employees		Row Total	
	N	%	N	%	N	%	N	%
1 - 4								
5 - 9	1	8%	1	8%			2	15%
10 - 19	1	8%					1	8%
20 - 49					1	8%	1	8%
50 - 99			1	8%			1	8%
100 - 249	4	31%					4	31%
250 - 499	2	15%	1	8%			3	23%
500 - 999	1	8%					1	8%
1000+								
Column Total	9	69%	3	23%	1	8%	13	100%

Item 2 by Item 14. (Size of company by class time frame preferred for employees.)

Number of Employees	Day		Evening		Weekend		Row Total	
	N	%	N	%	N	%	N	%
1 - 4								
5 - 9			1	7%	1	7%	2	14%
10 - 19			1	7%			1	7%
20 - 49			1	7%			1	7%
50 - 99	1	7%					1	7%
100 - 249			4	29%			4	29%
250 - 499			3	21%			3	21%
500 - 999			2	14%			2	14%
1000+								
Column Total	1	7%	12	86%	1	7%	14	100%

Item 2 by Item 15. (Size of company by type of training.)

Percentages represent percentage of row total.

Number of Employees	One-day Seminars A		Multiple-day Seminars B		In-house Training C		Credit Courses D		Non-Credit Courses E		Other F		Row Sum
	N	%	N	%	N	%	N	%	N	%	N	%	N
1 - 4	1	100%											1
5 - 9	7	27%	6	23%	4	15%	4	15%	5	19%			26
10 - 19	1	33%			2	67%							3
20 - 49	7	25%	5	18%	5	18%	5	18%	6	21%			28
50 - 99	6	29%	5	24%	3	14%	3	14%	3	14%	1	5%	21
100 - 249	10	36%	7	25%	3	11%	3	11%	5	18%			28
250 - 499	6	27%	5	23%	2	9%	4	18%	4	18%	1	5%	22
500 - 999	3	25%	3	25%	2	17%	3	25%	1	8%			12
1000+													
Column Total	41	29%	31	22%	21	15%	22	16%	24	17%	2	1%	141

Item 2 by Item 17. (Size of company by associated skills.)

Percentages represent percent of row total.

Number of Employees	A*		B*		C*		D*		E*		F*		G*		H*		Row Sum
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
1 - 4	1	20%	1	20%	1	20%			1	20%	1	20%					5
5 - 9	5	16%	4	13%	4	13%			7	23%	5	16%	3	10%	5	16%	31
10 - 19	1	17%	1	17%					1	17%	2	33%			1	17%	6
20 - 49	8	19%	4	9%	6	14%	4	9%	7	16%	4	9%	3	7%	5	12%	43
50 - 99	6	16%	5	14%	5	14%	2	5%	5	14%	4	11%	5	14%	5	14%	37
100 - 249	10	19%	7	13%	7	13%	5	9%	9	17%	5	9%	3	6%	7	13%	53
250 - 499	6	15%	5	12%	5	12%	1	2%	7	17%	6	15%	4	10%	7	17%	41
500 - 999	1	6%	2	11%	3	17%	1	6%	3	17%	3	17%	2	11%	3	17%	18
1000+																	
Column Total	33	16%	29	12%	31	13%	13	6%	40	17%	30	13%	20	9%	33	14%	234

*skills/tasks associated with environmental technology in which company engages:

A= Collection of air, water, soil samples

B= Chemical and instrumental analysis

C= Waste treatment, storage, and disposal (RCRA)

D= Remediation/bioremediation

E= Regulatory compliance (OSHA, DOT, CIRCLA, EPA)

F= Occupational health

G= Statistical analysis/risk assessment

H= HAZWOPER/emergency response

Item 7 by Item 12. (Required work experience by whether or not company would send its employees to LCC for an associate degree in Environmental Technology.)

Minimum Work Experience	Yes		No		Uncertain		Row Total	
	N	%	N	%	N	%	N	%
None	4	9%	3	7%	8	19%	15	35%
< 1 year	2	5%	1	2%	2	5%	5	12%
1 - 2 years	7	16%	2	5%	11	26%	20	47%
3 - 4 years	1	2%	2	5%			3	7%
> 4 years								
Column Total	14	33%	8	19%	21	49%	43	100%

Appendix A



ENVIRONMENTAL TECHNICIAN

The purpose of this survey is to assist the Lexington Community College (LCC) in gathering information about employment trends and educational needs in the Environmental Technician field. Your responses will help provide direction to our future programming efforts. The names of facilities replying will not be released. We appreciate the time you will take to complete this survey.

An environmental technician performs one or more of the following general job duties: implementing OSHA, EPA, DOT, or other requirements; monitoring/sampling the environment; auditing the workplace for potential hazards; informing and training workers regarding potential hazards; implementing appropriate controls; technical writing and computer applications.

1. Does your firm/facility presently employ or utilize the services of personnel in the Environmental Technology field?

☐ Yes
☐ No

If you answered NO to question number 1, you have completed this survey. Please return this survey in the enclosed envelope.

2. Please indicated the total number of employees at your firm/facility.

(Check one): ☐ 1-4 ☐ 20-49 ☐ 250-499
☐ 5-9 ☐ 50-99 ☐ 500-999
☐ 10-19 ☐ 100-249 ☐ 1000+

3. Please indicate the total number of employees doing environmental technician work. _____

4. Please enter the entry-level annual salary for environmental technicians. \$ _____

5. What is the minimum level of education **required** of an entry-level environmental technician?

(Check one): ☐ Less than high school completion
☐ High school completion
☐ 1-year post-secondary diploma
☐ 2-year post-secondary associate's degree
☐ 4-year bachelor's degree
☐ Other (please specify) _____

6. What is the minimum level of education **preferred** of an entry-level environmental technician?

(Check one): ☐ Less than high school completion
☐ High school completion
☐ 1-year post-secondary diploma
☐ 2-year post-secondary associate's degree
☐ 4-year bachelor's degree
☐ More than a 4-year degree
☐ Other (please specify) _____

7. What is the minimum level of work experience **required** for an entry-level technician?

(Check one): ☐ None
☐ Less than one year
☐ One to two years
☐ Three to four years
☐ More than four years

8. What is the minimum level of work experience **preferred** for an entry-level technician?
(Check one): ☐ None
☐ Less than one year
☐ One to two years
☐ Three to four years
☐ More than four years
9. Please estimate your needs for environmental technicians over the next 5 years.
(Check one): ☐ Our needs for environmental technicians will decrease
☐ Our needs for environmental technicians will remain stable
☐ Our needs for environmental technicians will increase
We estimate the following number of job openings in the next 5 years: _____
10. Please estimate the total number of employees within your firm/facility whom you think would be interested in enrolling in an Environmental Technician program. _____
11. Would completion of a two-year Environmental Technician program lead to job advancement in your firm/facility?
☐ Yes
☐ No
12. Would your firm/facility send its employees to Lexington Community College for an associate degree in Environmental Technology?
☐ Yes
☐ No
☐ Uncertain
13. If you answered yes to #12, please indicate the total number of employees your firm/facility would encourage to attend the community college for education in environmental technology. _____
14. If you answered yes to #12, what time frame for class offerings do you prefer for your employees?
(Check one): ☐ Day classes
☐ Evening classes
☐ Weekend classes
15. Would your firm/facility send its employees to Lexington Community College for environmental/certification training as required by OSHA, EPA, etc.?
(Please check all that apply): ☐ One-day seminars
☐ Multiple-day seminars
☐ In-house training
☐ Credit courses
☐ Non-credit courses/Certification
☐ Other (please specify) _____
16. Would your firm/facility be interested in having a LCC student enroll in an Environmental Technician Program, serve an internship or have a cooperative work experience at your site?
(Check one): ☐ Yes
☐ No
☐ Maybe

17. The following is a list of skills/tasks that may be associated with environmental technology. Please check all that apply to your firm. Add any other items/comments at the end of the survey.

- ☐ Collection of air, water, soil samples
- ☐ Chemical and instrumental analysis
- ☐ Waste treatment, storage, and disposal (RCRA)
- ☐ Remediation / bioremediation
- ☐ Regulatory compliance (OSHA, DOT, CERCLA, EPA)
- ☐ Occupational health
- ☐ Statistical analysis / risk assessment
- ☐ HAZWOPR / emergency response

18. What do you see as the new and emerging trends in the field of environmental technology?

19. What specific courses/seminars/workshops, etc. might we at the Lexington Community College offer to meet your future training needs?

Additional comments:

If you would like a copy of the survey results, please provide your name and address below.

Attn:

THANK YOU FOR YOUR TIME IN COMPLETING THIS SURVEY